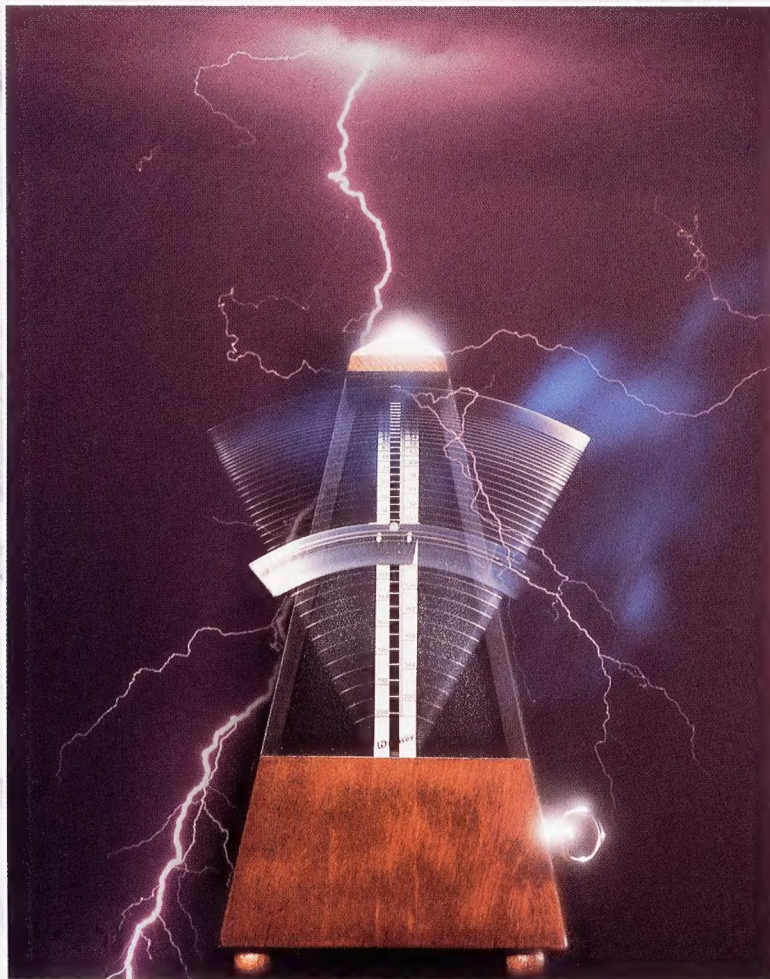


**ZEUS™ ADVANCED VIDEO PROCESSOR.  
UNCOMPROMISED PERFORMANCE  
AND CREATIVE FLEXIBILITY TOO!**



**AMPEX**



# THE ZEUS™ PROCESSOR ESTABLISHES NEW STANDARDS IN TYPE C VIDEO AND CREATIVE FLEXIBILITY TRANSPARENCY

**T**HE EMMY AWARD WINNING Zeus Advanced Video Processor, when integrated with any Ampex Type C studio VTR, provides revolutionary improvements in the quality and production flexibility of videotape recording.

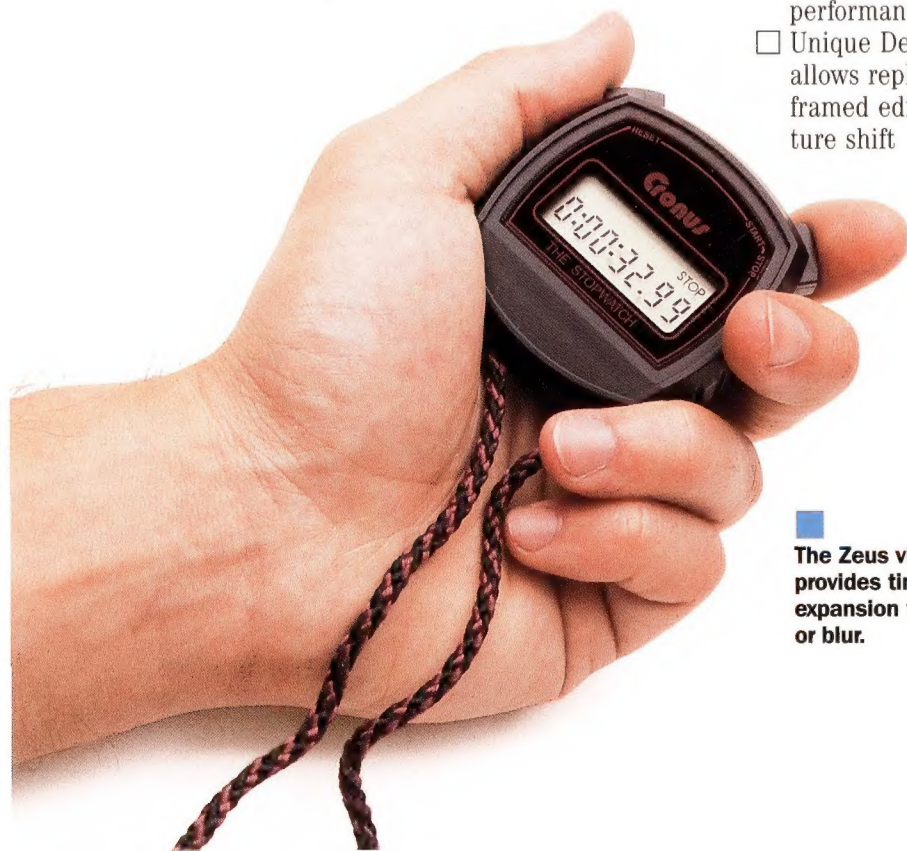
Production and post-production facilities especially appreciate the superb video processing and greater creative video control capabilities of the Zeus. Its unique ability to extend practical multi-generation limits of the Type C recording improves their product, and saves them time and money.

The Zeus processor is the first system to eliminate the picture bounce or blur previously associated with video correction in variable

speed playback, slow-motion editing and time compression/expansion operations. Superior design insures the very best variable speed picture quality with even the most demanding video.

#### Key Features:

- ☐ No compromise 4Fsc, 9-bit digital system
- ☐ Drift and adjustment-free velocity compensation dramatically improves compensation accuracy and multi-generation video performance
- ☐ Exclusive frame averaging velocity compensation function reduces head impact error visibility
- ☐ Superior spatial-averaging dropout compensation
- ☐ Exclusive Multi-Gen Setup mode greatly improves multi-generation video performance
- ☐ Unique Decode mode allows replay of non-color framed edits with no picture shift
- ☐ Video time compression and expansion with no picture bounce or blur
- ☐ Full frame storage on command
- ☐ Comprehensive interface with VPR-3 menu control system
- ☐ Available full-function serial remote control panel
- ☐ Dual, time-share video inputs and optional Heterodyne VTR processing
- ☐ Available in NTSC, PAL, PAL/SECAM and PAL-M versions
- ☐ Compatible with all Ampex Type C studio VTRs, including the VPR-2 and VPR-2B



**The Zeus video processor provides time compression/expansion without bounce or blur.**

**Zeus Advanced Video Processor version with local control panel (non-VPR-3 configuration).**

# ENGINEERING EXCELLENCE TO MEET YOUR NEEDS

**A**N INNOVATIVE, STATE-of-the-art system architecture gives the Zeus Advanced Video Processor the power to deliver both uncompromised video performance and new levels of creative flexibility. Among the many Zeus attributes that combine to achieve this are:

#### Processing Transparency

The Zeus system uses  $4 \times \text{Fsc}$  A/D sampling, with a 9-bit dynamic range, to provide exceptional bandwidth, linearity and signal-to-quantizing noise ratio for transparent signal processing.

#### Velocity Compensation

Velocity error measurement is taken from off-tape burst after the video has been digitized, with accuracy to a fraction of a degree. This precisely measured error is immediately applied to the A/D clock, forming a closed loop feedback system. Thus, the system continually monitors itself for residual errors, and corrects them.

Head impact errors are corrected by the exclusive Zeus frame averaging velocity compensation. This system achieves a reduction of impact error amplitude by approximately 10 dB, or a

three times reduction in visibility.

#### Dropout Compensation

A superior spatial-averaging dropout compensation technique is employed that analyzes video information around the missing dropout video to produce an optimum, transparent, video replacement

#### Multi-Generation Setup

Multi-generation video performance degradation only significantly exhibits itself when it's too late to fix it—in the finished product.





The Zeus video processor, integrated with a VPR-3 or VPR-6, provides an exclusive Multi-Gen Setup mode which helps eliminate operational setup errors — major contributors to multi-generation performance degradation.

#### Decode Mode

When the Zeus Decode mode is activated, an adaptive digital comb filter decoder is inserted into the digital video path. This decoder corrects the off-tape SCH inversions of non-color framed edits, totally eliminating normally expected horizontal picture shifts.

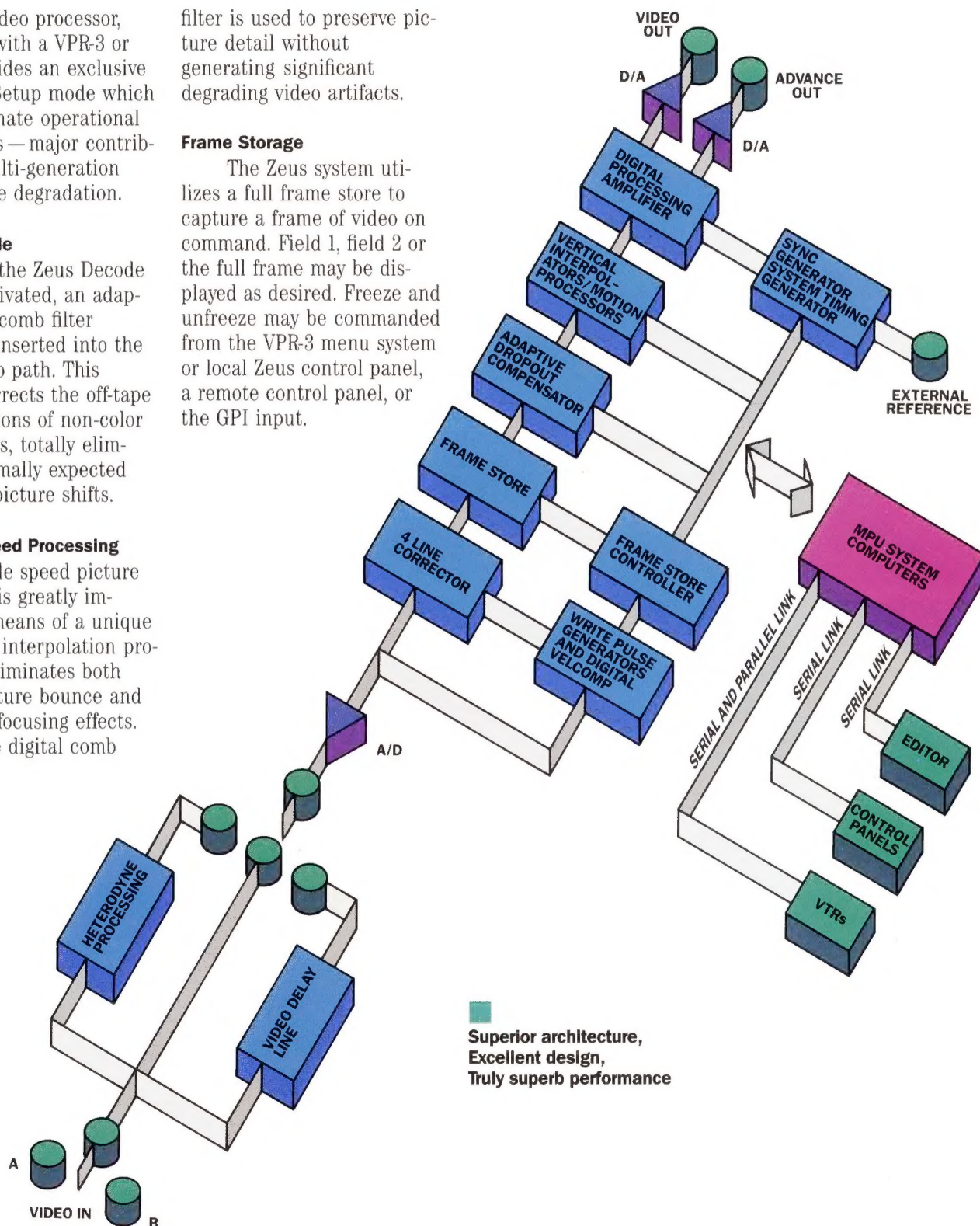
#### Variable Speed Processing

Variable speed picture processing is greatly improved by means of a unique line-by-line interpolation process that eliminates both vertical picture bounce and periodic defocusing effects. An adaptive digital comb

filter is used to preserve picture detail without generating significant degrading video artifacts.

#### Frame Storage

The Zeus system utilizes a full frame store to capture a frame of video on command. Field 1, field 2 or the full frame may be displayed as desired. Freeze and unfreeze may be commanded from the VPR-3 menu system or local Zeus control panel, a remote control panel, or the GPI input.



Superior architecture,  
Excellent design,  
Truly superb performance

# ZEUS SPECIFICATIONS

GENERAL	NTSC/PAL-M 525/60	PAL/SECAM 625/50
Digital Sampling Frequency:	4Fsc (14.3 MHz)	4Fsc (17.7 MHz)
Quantizing Levels:	512 (9 bits)	512 (9 bits)
Size:	19" (483 mm)W × 11" (279 mm)H × 23¼" (590 mm)D	19" (483 mm)W × 11" (279 mm)H × 23¼" (590 mm)D
Weight:	less than 80 lbs. (36 kg)	less than 80 lbs. (36 kg)
Power Requirements:	less than 750 watts 90—142 VAC, 47—63 Hz	less than 750 watts 180—284 VAC, 47—63 Hz
Operating Environment: Temperature Humidity	0° to 45° C (32°—113° F) 10—90% RH (non-condensing)	0° to 45° C (32°—113° F) 10—90% RH (non-condensing)
VIDEO SIGNAL PERFORMANCE		
Bandwidth:	Flat (± 0.2 dB) to 5.0 MHz	Flat (± 0.2 dB) to 6.0 MHz
Signal-To-Noise Ratio: (P-P Video to RMS Noise, unweighted)	Better than – 58 dB	Better than – 58 dB
Differential Gain²: Differential Phase²:	<2% <2°	<2% <2°
Transient Response (2T Pulse and Bar):	<1% K Factor	<1% K Factor
Chrominance/Luminance Delay:	<10 nsec.	<10 nsec.
Chrominance/Luminance Crosstalk³:	<1.0%	<1.0%
TIME BASE PERFORMANCE		
Correction Range (Window)	60 television lines	60 television lines
Digital Memory Size:	1 television frame	1 television frame
Output Jitter⁴: Monochrome: Color:	< ± 10 nsec. < ± 2.5 nsec.	< ± 10 nsec. < ± 2.5 nsec. PAL, < ± 10 nsec. SECAM
Slow Motion Range: (limited by VTR)	– 1 to + times play speed, full color recovery	
Shuttle Range Monochrome: Color:	from 20 to 50 times play speed up to 20 times play speed ((VTR model dependent)	
Color Gen-Lock Stability:	Better than 0.2°	
Sync Generator Frequency Tolerance:	0.005% (No external reference)	
INPUT SIGNALS		
Tape Video:	1 V, P-P, + 3.0 dB—6.0 dB Composite Video (75 Ohms)	
Het/Aux Video:	1 V, P-P, + 3.0 dB Composite Video (75 Ohms)	
Reference Video:	1 V, P-P, ± 6.0 dB Composite Video or Black-burst, (Loop-through)	
General Purpose Interface:	Freeze start, Freeze stop	
OUTPUT SIGNALS		
Video Output (1): (2):	1 V P-P Composite (75 Ohms) 1 V P-P Composite (75 Ohms) or non-composite	
Sync-Coherent S.C.:	2 V P-P sine wave at S.C. frequency when terminated into 75 Ohms. (Heterodyne processor accessory must be installed)	
VTR Advanced Reference (1 & 2):	Standard level black-burst signal when terminated into 75 Ohms. 28 lines in advance of reference. Fixed SCH phase	
Advanced Drive:	Composite sync or vertical drive (internally selectable) – 4 V P-P when terminated into 75 Ohms. 28 lines in advance of reference	
OUTPUT ADJUSTMENT RANGE		
Output Video Level:	From black to +3.0 dB of unity	
Chroma Level:	From zero chroma to +3.0 dB of unity	
Black Level:	– 10 to +10 IRE	
Pedestal:	0 to – 11 IRE (determines operating point of black clipper)	
Chroma Phase:	± 20 degrees	
System S.C. Phase:	360°, continuous at the same time moving output sync phase in 0.25° of S.C. increments⁵	
System Sync Phase:	42 cycles of S.C. early, to 21 cycles of S.C. late	
System Output ScH Phase:	± 180° of standard ScH phase	
Horizontal Picture Position:	± 4.5 cycles of S.C. (½ cycle increments with Decode on; full cycle increments of Decode off)⁵	
Vertical Picture Position:	± 2 horizontal lines⁵	

<sup>1</sup> System signal-to-noise ratio is determined from the degradation to input signal-to-noise ratio. That is, 47 dB VTR S/N=46.67 dB at Zeus output. This reflects a Zeus signal-to-noise ratio of 58 dB.

<sup>2</sup> Defined as degradation of the differential gain or phase of the input signal, measured using a subcarrier modulated ramp with subcarrier amplitude equal to that of burst.

<sup>3</sup> Measured with 0 to 70% chrominance subcarrier signal superimposed on a 50% APL luminance pedestal.

<sup>4</sup> Residual output error is directly dependent on the S/N of the input signal. Specification based on an input S/N of 47 dB.

<sup>5</sup> Not applicable to SECAM.

Amplex reserves the right to make product and specification changes at any time without notice.



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Audio-Video Systems Division

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# ZEUS PORT

## D2 DIGITAL OUTPUT INTERFACE FOR THE ZEUS™ ADVANCED VIDEO PROCESSOR

### The Type C to D2 Digital Link

- Zeus Port: a new output interface for the Ampex Zeus advanced video processor.
- Zeus Port eliminates the additional digital-to-analog and analog-to-digital (D/A and A/D) conversion steps normally required for transfer, thus fully maintaining the highest quality Type C signal.
- Zeus Port is an exclusive for the Zeus advanced video processor and Ampex Type C VPRs.

### User Benefits

**Unsurpassed Performance.** Direct digital dubbing from an Ampex Type C VTR to a D2 machine—such as the Ampex VPR-300—provides the optimum performance between the current analog program interchange format, Type C, and the digital program interchange format of the future, D2.

### Enhancement of Your Type C Investment

Ampex has always valued our customers' investment in our products. As such, product design has always considered upgrade paths for our users.

### Why Only Zeus?

Unlike other high quality conventional time base correctors, the Zeus advanced video processor executes complete line-by-line correction of time base errors, including full velocity error correction, at the input before the video data is written into memory. Thus the digital video data read out of memory is free of timebase errors. (See Figure 1.)

Other time base correctors perform correction at the inputs, however, residual velocity errors exist within the TBC until correc-

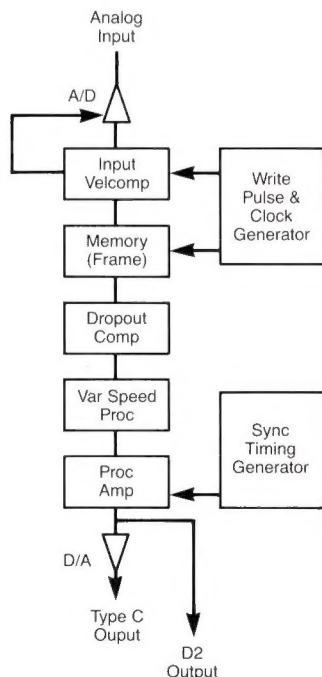
tion in the final D/A stage. This is accomplished by measuring the residual velocity error taken at the input and modulating the video D/A Converter clock, at the output of the TBC, thus modifying the timing of the analog video signal. (See Figure 2.)

This action results in the final velocity error correction being done during the digital to analog conversion process.

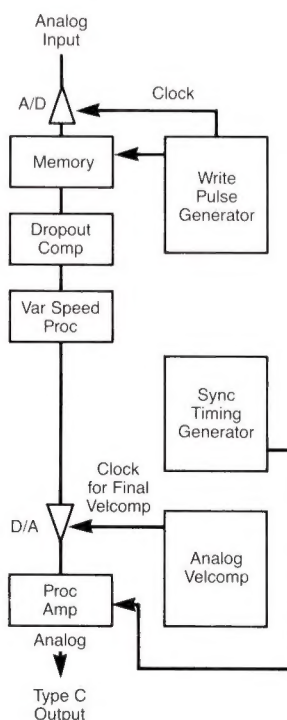
The parallel digital video data used in the D2 format must be completely free of timebase errors. Based on the above description, Zeus is the only timebase corrector that can provide such data.

The D2 digital interface standard requires that sync, burst, and blanking be present in the digital data stream. The Zeus processor integrates all reference signals with

**Figure 1**  
**Zeus**  
**Advanced Video Processor**



**Figure 2**  
**High Quality**  
**"Digital" TBC**





the corrected video signal in the digital domain, before digital to analog conversion takes place.

### Installation

Zeus Port can be installed by your technical staff in about six hours. Installation assistance is available through your Ampex Field Office at current field service rates.

### Ordering Information

Any Ampex Type C recorder can be equipped with a D2 composite digital format output by field upgrading its Zeus processor.

NTSC 525 Part No. 1480190  
for Tape Clock 2 #1472668

NTSC 525 Part No. 1480187  
for Tape Clock 2 #1430158

PAL-M 525 Part No. 1480181

PAL 625 Part No. 1480184

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